WHAT IS CLAIMED IS

1. A single-photon generator, comprising:

an exciton generation part including therein a quantum dot;

an excitation part for generating an exciton in said exciton generator part;

a recombination control part for controlling recombination timing of said exciton in said exciton generation part; and

an optical window provided in said exciton generation part so as to pass a single photon formed as a result of recombination of said exciton,

said recombination control part causing, in said exciton generation part, recombination of said exciton at longer intervals than a recombination lifetime of a exciton molecule.

2. The single-photon generator as claimed in claim 1, wherein said exciton generation part includes a type II heterojunction in said quantum dot.

3. The single-photon generator as claimed in claim 2, wherein said quantum dot changes a composition thereof from one side of said quantum dot to the other side of said quantum dot continuously.

4. The single-photon generator as claimed in claim 1, wherein said quantum dot is formed of a quantum dot grown by S-K mode growth process.

5. The single-photon generator as claimed in claim 1, wherein said quantum dot is formed of a lamination of an InAs layer and a GaSb layer sandwiched by a pair of AlAs layers, said InAs layer changing a composition thereof continuously toward said GaSb layer.

6. The single-photon generator as claimed in claim 1, wherein said recombination control part comprises an electrode provided in said exciton generator part, a voltage source for applying a bias voltage to said electrode, and a switch circuit for controlling application of said bias voltage to said electrode, said switch circuit supplying said bias voltage to said electrode with a longer interval than a recombination lifetime of said exciton molecule.

7. The single-photon generator as claimed in claim 6, wherein said optical window is provided in said electrode.

8. The single-photon generator as claimed in claim 1, further comprising an optical gate member provided on a path of said single photon.

9. The single-photon generator as claimed in claim 8, wherein said optical gate member is controlled by said recombination control part and passes said single photon in synchronization with recombination of said exciton.

10. The single-photon generator as claimed in claim 1, wherein said excitation part comprises a laser.

11. A single-photon generating method, comprising the steps of:

forming an exciton in a medium; and

generating a single photon by causing recombination in said exciton,

said recombination being conducted with an interval longer than a recombination lifetime of a exciton molecule in said medium.

12. The method as claimed in claim 11,

wherein said step of causing recombination of said exciton includes a step of applying an electric field to said medium.

13. The method as claimed in claim 11, wherein said medium includes a quantum dot of type II heterojunction.